



WELDING PROCEDURE SPECIFICATION

WPS - 3500-1 **REV. NO.:** 0 **DATE:** 10/6/2004 ****APPLICABILITY****
WELDING PROCESS/ES: FCAW **and** FCAW **ASME:** X **AWS:** X
SUPPORTING PQR: P-WPS-250 **OTHER:** AISC

JOINT This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type: Groove/fillet	Class: Full/partial penetration
See GWS 1-06 for joint details	Preparation: Mechanical/thermal
Root Opening: 1/16'-3/16'	Backing: Req'd or back gouge root
Backgrind root: Root if req'd.	Backing Mat.: CS strap/ring
Bkgrd Method: Grind/chip/file/arc gouge	GTAW Flux: N/A Backing Retainer: N/A

FILLER METALS: **Class:** E7xT-x **and** -----
A No: 1 **SFA Class:** 5.20 **and** --- **F No:** 6 **and** --- **Size:** .072 --- --- ---
Insert: N/A **Insert Desc.:** N/A **Weld Metal Thickness Range:**
Flux: Type: N/A **Size:** N/A **AWS:** 0.187 thru 1.500
Filler Metal Note: **ASME:** 0.187 thru 1.500

BASE MATERIALS:	P No. 1	Gr No. *	to: P No. 1	Gr No. *	
Spec. Steel & steel alloys	Grade: All	to: Spec. Steel & steel alloys	Grade: All		
Qualified Pipe Dia Range: = : 4					
Qualified Thickness Range:	AWS: 0.187 thru 1.500	ASME: 0.187 thru 1.500			

QUALIFIED POSITIONS: Plate-all	Pipe-all	Vertical Progression: V-UP
Preheat Min. Temp.: *70 °F	GAS: Shielding: None	or None
Interpass Max. Temp.: 500 °F	Gas Composition: 0 %	0 % 0 %
Preheat Maintenance: *70 °F	Gas Flow Rate cfh: 0	to 0
	Backing Gas/Comp: None	0 %
PWHT: Time @ °F Temp. N/A	Backing Gas Flow cfh: 0	to 0
Temp. Range: 0 °F to 0 °F	Trailing Gas/Comp: 0	%

PREPARED BY: <u>KG Fellers</u> Signature on file at FWO-DECS	DATE: 10/6/2004
APPROVED BY: <u>Tobin Oruch</u> Signature on file at FWO-DECS	DATE: 10/6/2004

Note: For SC/SS/ML-1/ML-2 work, this WPS requires independent review.

WELDING CHARACTERISTICS:

Current: DCEP and --- **Tungsten type:** N/A **Transfer Mode:** Globular
Ranges: Amps 130 to 0 **Pulsing Cycle:** N/A to N/A
Volts 16 to 0 **Background Current:** N/A
Fuel Gas: N/A **Flame:** N/A **Braze temp. °F** N/A to N/A

WELDING TECHNIQUE: For cleaning, grinding, and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Semi-auto **Cleaning Method:** Wire brush/grind/file
Single Pass or Multi Pass: M **Stringer or Weave bead (S/W):** S **Oscillation:** N/A
GMAW Gun Angle °: 0 to 10 **Forehand or Backhand for GMAW (F/B):** BH
GMAW/FCAW Tube to work distance: 1/2"-1"
Maximum K/J Heat Input: N/A **Travel speed:** As reqd. **Gas Cup Size:** N/A

No single pass shall deposit greater than 1/2" thickness of material.

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A **Nil-Ductil Transition Temperature:** N/A **Dynamic Tear:** N/A

Comments: (1) *IPT and Preheat for material = 3/4" = 225 °F min.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzel Angle	Other
1	FCAW	E7xT-x	.072	130 to 350	16 to 23	6 to 12	0 - 10	
2	FCAW	-----	---	0 to 0	0 to 0	---- to ----		
3	FCAW	-----	---	0 to 0	0 to 0	---- to ----		
4			---					
5			---					
6								
7								
8								
REM	* Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.							

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees possession and use of LANL procedures and qualifications.